AXEL BENYAMINE

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Education

UNIVERSITY OF CAMBRIDGE, Cambridge, UK **2024-2025**
- Master of Advanced Studies in Mathematics (Part III), specializing in Statistics and Probabilities
- 2nd best Mathematics University worldwide (QS 2023)
- Relevant coursework includes *Modern Statistical Methods, Causal Inference* and *Information Theory*

Graduated with Merit

ECOLE POLYTECHNIQUE, Palaiseau, FRANCE **2021-2024**
- France's leading science and engineering university ("Grande Ecole")
- A Master's level program, specialized in Applied Mathematics
- Relevant coursework includes *Operational Research*, *Statistical Learning* and *Machine Learning*

GPA: 3.87/4.00

LYCEE PRIVE SAINTE-GENEVIEVE, PREPARATORY PROGRAM, Versailles, FRANCE **2019-2021**
- A **post-secondary** two-year program (MPSI/MP*) in advanced math and physics leading to nationwide entrance examinations to the Grandes Ecoles for scientific studies
- Undergraduate coursework includes *Linear Algebra*, *Topology* and *Probability*

GPA: 3.99/4.00

Project work

RESEARCH PROJECT *(Essay)*, **University of Cambridge** **Feb-May 2025**
- $\longrightarrow$ New Advances in Conformal Prediction – Under the guidance of Prof. **R. D. Shah** – Department of Statistical Science
- Exploring uncertainty-aware prediction sets with non-asymptotic, distribution-free guarantees
- Enhancing prediction set efficiency, conditional coverage, and adaptability to distribution shifts, while applying methods to outlier detection

TEAM RESEARCH PROJECT *(EA Recherche)*, **Ecole Polytechnique** **Sep-Dec 2023**
- $\longrightarrow$ Study of dynamics in simulations of stochastic processes – Under the guidance of Asst. Prof. **Clement Rey** – Department of Applied Mathematics
- Simulated Ito processes over extended time frames
- Proposed increasingly precise polynomial approximations as limits for simulated processes

EXPERIMENTAL PROJECT *(Modal)*, **Ecole Polytechnique** **Feb-May 2023**
- $\longrightarrow$ Department of Applied Mathematics – Under the guidance of Asst. Prof. **Clement Rey**
- Research project on predicting the default risk of companies whose value follows a geometric Brownian motion
- Implemented statistical simulation methods for low probabilities in Python
- Simulated default risks using Monte Carlo, splitting and particle methods

SCIENTIFIC TEAM PROJECT *(PSC)*, **Ecole Polytechnique** **Sep 2022-May 2023**
- $\longrightarrow$ Study of the mathematical game Dots and Boxes – Under the guidance of Asst. Prof. **Lucas Gerin** – Department of Applied Mathematics
- Designed and implemented multiple solvers for the game Dots and Boxes
- Designed an innovative solver based on the MiniMax and Monte Carlo Tree Search algorithms

EXPERIMENTAL PROJECT *(TIPE)*, **Lycee prive Sainte-Genevieve** **Sep 2020-May 2021**
- $\longrightarrow$ Undergraduate research project on a public-key cryptography system based on the properties of the braid group, a mathematical group – Under the guidance of Prof. **Aymeric Autin**
- Designed and implemented on Python an end-to-end public-key cryptography system whose security relies on the non-commutativity of the braid group

Internship

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA, USA **Apr-Aug 2024**
- $\longrightarrow$ Graduate **research** intern at Operation Research Center – Under the supervision of Prof. **Alexandre Jacquillat** – Infill development, design and optimization
- Developed optimization models and algorithms to support infill development in major cities, with the objective of maximizing a social welfare function
- Undertook data collection, model development, mathematical analysis, and computational activities

INFOSYS LIMITED, Bangalore, INDIA   **Jun-Aug 2023**

- Infosys Limited, EdgeVerve branch – AI branch specializing in business software development for companies
- Developed an AI tool to optimize the exchange of business information within a company
- Devised an efficient system for extracting crucial information from business documents, reducing information extraction costs by 30% while maintaining quality
- Developed the extraction tool on Python utilizing Natural Language Processing models

NATIONAL GENDARMERIE – OFFICER CADET   **Sep 2021-Mar 2022**

- Part of Ecole Polytechnique's first year curriculum
- Assisted unit commander in drawing up emergency plans for riot control and prevention
- Took part in field operations (investigations, tracking of suspects, arrest of organized gang thieves)
- Dealt with cases of family abuse and battered children

Skills

- **Programming**
  - Python, Julia, Java, C++, SQL
  - Machine Learning: TensorFlow, PyTorch, Scikit-learn

- **Languages**
  - French (fluent), English (TOEFL: 103), Spanish (intermediate)

Awards

Awards
- Outstanding Leadership award bestowed by Ecole Polytechnique   **2023**
- Outstanding Investment award for involvement in Ecole Polytechnique's student community   **2023**
- Winner of the QuantumBlack AI Hackathon at Ecole Polytechnique on Greenhouse Gas Emission Reduction   **2023**

French Olympiads of Mathematics   **2018**
- Gold Medal, Academy of Nice, FRANCE
- INRIA Gold Medal, Academy of Nice, FRANCE
- Ranked 41st nationally

Extracurricular activities

STUDENTS ASSOCIATIVE LIFE
- **Career Fair (X-Forum Association) – President**   **2021-2023**
  - President of an association organizing an annual career fair gathering 150 companies and 2000 students
  - Association of 58 students with an annual turnover of €700,000
  - Managed the event organization, the coordination with companies, school administration, and service providers
  - Led the association's team with effective management

- **Ecole Polytechnique's Ecological Association (NeXt) – Conference organizer**   **2022-2023**
  - Organized monthly conferences on ecological topics with researchers, experts, journalists, or industry professionals
  - Prospected potential speakers and organized the logistics of the events

- **Ecole Polytechnique's Welcome Week – Security Manager**   **2023**
  - Ensured a safe environment, focusing on the prevention of sexual and gender-based violence
  - Made proactive measures that led to a secure and respectful event, creating a positive experience for all participants

TEACHING EXPERIENCE – **Jussieu Neighborhood Center, Versailles, FRANCE**   **2019**
- Helped struggling students from less privileged districts
- Assisted 8th and 9th grade students in organizing their homework and raising their academic ambitions

MISCELLANEOUS
- Basketball (6 hours per week at Ecole Polytechnique) and Squash (4 hours per week at Cambridge)
- Former member of the Youth Regional Parliament for the PACA region, FRANCE (2016-2019), and the Youth City Council of Cannes, FRANCE (2016-2018)